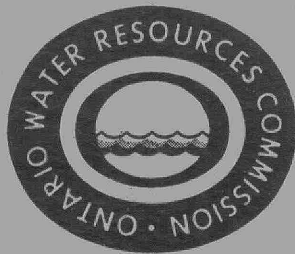


CA2 ON
WR 610
1970
V16



O.W.R.C.
Water Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

COMMUNITY OF VAL RITA

DISTRICT OF COCHRANE



1970

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CADON
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REPORT

on a

WATER POLLUTION SURVEY

of the

COMMUNITY OF VAL RITA

TOWNSHIP OF OWENS (UNORGANIZED)

DISTRICT OF COCHRANE

October 1970

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

A water pollution survey of the Community of Val Rita was conducted in July, 1970. The purpose of the survey was to locate and record all significant sources of water pollution within the townsite. Such surveys are performed routinely, and upon request, by the Ontario Water Resources Commission as a basis for evaluating all existing and potential sources of pollution. When sources of pollution are located corrective action by the responsible parties is requested by the Commission.

The assistance provided during the survey by the Department of Health Regional Laboratory in Timmins is gratefully acknowledged.

I GENERAL INFORMATION

The Community of Val Rita is located 6½ miles west of the Town of Kapuskasing on Highway No.11 in the unorganized Township of Owens, District of Cochrane. The population of the townsite is estimated to be 300 persons.

The community is located on poorly drained, gradually sloping, predominantly clay, glacial till overburden. The townsite is drained to the south-east by an unnamed watercourse which flows under Highway No.11 and the Canadian National Railway tracks.

This watercourse drains the area to the Kapuskasing River.

II WATER SUPPLY

The community of Val Rita does not have a communal water works. Domestic water is obtained from individual privately-owned drilled or dug wells. Samples for bacteriological examination were taken from six of these wells. The laboratory results indicate that three of these wells contain coliform organisms. Faecal coliforms were present in two of these adverse samples indicating pollution from human or animal excrement.

III WATER POLLUTION

There is no sewerage system in the community. Domestic wastes are treated by private septic tank and tile bed systems. However, due to the clay overburden, the majority of these septic tanks do not operate effectively. The laboratory results of samples collected from ditches throughout the townsite indicate that domestic wastes appear to be draining from the malfunctioning septic tank systems to the roadside ditches.

IV LABORATORY RESULTS OF SAMPLES

The laboratory results of the bacteriological examinations and chemical analyses performed on the samples collected from the roadside ditches within the townsite are listed in Tables I and II appended to this report. Eleven samples were collected from the various sampling locations as shown on the attached map.

All of the samples contained coliform counts in excess of the Commission's objective for surface water, which is a maximum 2400 coliform organisms per 100 ml. of sample.

A description of the bacteriological examinations and chemical analyses performed, together with tables of these laboratory results and a discussion of the Commission's objectives for surface waters are appended to the report.

V REFUSE DISPOSAL

A communal garbage collection service has not been organized by the residents of Val Rita. It would appear that domestic refuse is disposed of on an individual basis.

VI SUMMARY AND CONCLUSIONS

A water pollution survey of the community of Val Rita was conducted by Ontario Water Resources Commission personnel in July, 1970.


The community does not have communal water or sewerage facilities. The soil type in the area consists of a poorly drained clay overburden, which is generally unsuitable for the effective operation of septic tank systems.

The source of pollution in Val Rita consists of inadequately treated domestic wastes which drain to the roadside ditches and cause unsanitary conditions which constitute a potential public health hazard.

The results of this survey indicate the need for improved sewerage facilities for the Community of Val Rita. However, until such time as concrete action can be initiated in this regard, every effort should be made to protect the roadside ditches from contamination by domestic wastes.

JWG/fp

Prepared By:


J. W. Gilhooly
Civil Technologist
Div. of Sanitary Engineering

A P P E N D I X

APPENDIX I

SIGNIFICANCE OF LABORATORY RESULTS

BACTERIOLOGICAL EXAMINATION

The presence of faecal coliforms (FC) is indicative of pollution from human or animal excrement. The total coliform count represents the total number of coliform organisms present of both faecal and non-faecal origin.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indicator of the amount of oxygen required for the stabilization of decomposable organic or chemical matter.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved solids in the water. The concentration of suspended solids is generally the most significant to surface water quality. The effects of

suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Nitrogen

Ammonia Nitrogen or sometimes called free ammonia, is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically.

The following values may be of general significance in appraising free ammonia content:

Low - 0.015 to 0.03 ppm

Moderate - 0.03 to 0.10 ppm

High - greater than 0.10 ppm

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. A normal upper limit for Total Kjeldahl would be 0.5 ppm. Polluted water would have values in excess of this limit.

Nitrite Nitrogen

Nitrite is an intermediate step in the oxidation of ammonia. The presence of nitrite in concentrations greater than

a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample.

The following ranges in concentration may be used as a guide:

Low - less than 0.1 ppm

Moderate - 0.1 to 1.0 ppm

High - greater than 1.0 ppm

Phenols

The presence of phenols or phenolic equivalents is generally associated with pollutants containing petroleum products or with some classes of industrial wastes.

Adequate protection of surface waters will be assured if the concentrations of phenols or phenolic equivalents in wastes do not exceed 20 parts per billion (ppb).

Iron

The iron concentration in potable water should not exceed 0.3 parts per million to avoid objectionable tastes, staining and sediment formation.

WATER QUALITY OBJECTIVES

The OWRC objectives for surface waters in Ontario are as follows:

5-day Biochemical Oxygen Demand - not greater than 4
parts per million

Total Coliform Count - not greater than 2,400 coliforms
per 100 ml.

Phenolic Equivalents - Average - not greater than 2
parts per billion

- Maximum - not greater than 5
parts per billion

pH Range - 6.7 to 8.5

TABLE I- A

PRIVATE WELL SUPPLIES

| <u>Sampling Point No.</u> | <u>Location</u> | <u>Date</u> | <u>MPN</u> <u>Coliform Organisms</u> <u>per 100 ml.</u> | |
|-----------------------------------|--|-------------|---|--------------|
| | | | <u>Fecal</u> | <u>Total</u> |
| 2 - W | Husky service station well supply at east end of Community on Hwy. No.11 | July 31/70 | 2 | 2 |
| 5 - W | Private well supply on the north-east corner of inter- section of Second Street and Hwy. No.11. | July 31/70 | 0 | 0 |
| 6 - W | Private well supply on the south-east corner of the inter- section of Second Street and Second Avenue | July 31/70 | 0 | 0 |
| 8 - W | Private well supply on the north- east corner of the intersection of First Street and Second Avenue | July 31/70 | 0 | 0 |
| 13 - W | Private well supply on the north- west corner of the intersection of First Street and Hwy. No.11 | July 31/70 | 0 | 4 |
| 16 - W | Private well supply serving general store at the intersection of Lane Street and Hwy. No.11 | July 31/70 | 34 | 80+ |

NOTE: BACTERIOLOGICAL EXAMINATIONS WERE PERFORMED BY THE DEPARTMENT OF HEALTH
REGIONAL LABORATORY, TIMMINS, ONTARIO.

TABLE 1-B

CHEMICAL ANALYSES OF PRIVATE WELL SUPPLIES

| Sample No.- | <u>2 - W</u> | <u>6 - W</u> | <u>8 - W</u> |
|---|--------------|--------------|--------------|
| Hardness as CaCO_3 (in ppm.) | 268 | 352 | 378 |
| Alkalinity as CaCO_3 (in ppm.) | 265 | 361 | 397 |
| Iron as Fe (in ppm.) | 5.50 | 3.75 | 0.50 |
| Chloride as Cl (in ppm.) | 12 | 3 | 2 |
| pH at Lab. | 7.7 | 8.0 | 7.7 |
| Phenols (in ppb.) | 7 | 2 | 0 |

TABLE II- A

ROADSIDE DITCHES

| <u>Sampling Point No.</u> | <u>Location</u> | <u>Date</u> | <u>MPN</u> <u>Coliform Organisms</u> <u>per 100 ml.</u> | |
|-----------------------------------|---|-------------|---|--------------|
| | | | <u>Fecal</u> | <u>Total</u> |
| 1 - D | Drainage ditch at east end of Community crossing Hwy. No.11 | July 31/70 | 0 | 90 |
| 3 - D | Roadside ditch on Hwy. No.11 east of Third Street | July 31/70 | 22,000 | 2,400,000 |
| 4 - D | Roadside ditch on Second Street at Hwy. No.11 | July 31/70 | 54,000 | 1,500,000 |
| 7 - D | Roadside ditch on Third Street near Second Avenue | July 31/70 | 40 | 15,000 |
| 9 - D | Drainage ditch discharging into roadside ditch on First Street north of Second Avenue | July 31/70 | 250,000 | 1,400,000 |
| 10 - D | Roadside ditch on west side of First Street near Second Avenue | July 31/70 | 800,000+ | 3,400,000 |
| 11 - D | Drainage ditch outfalling to roadside ditch on west side of First Street | July 31/70 | 800,000+ | 8,000,000+ |
| 12 - D | Roadside ditch on east side of Lane Street | July 31/70 | 800,000+ | 8,000,000+ |

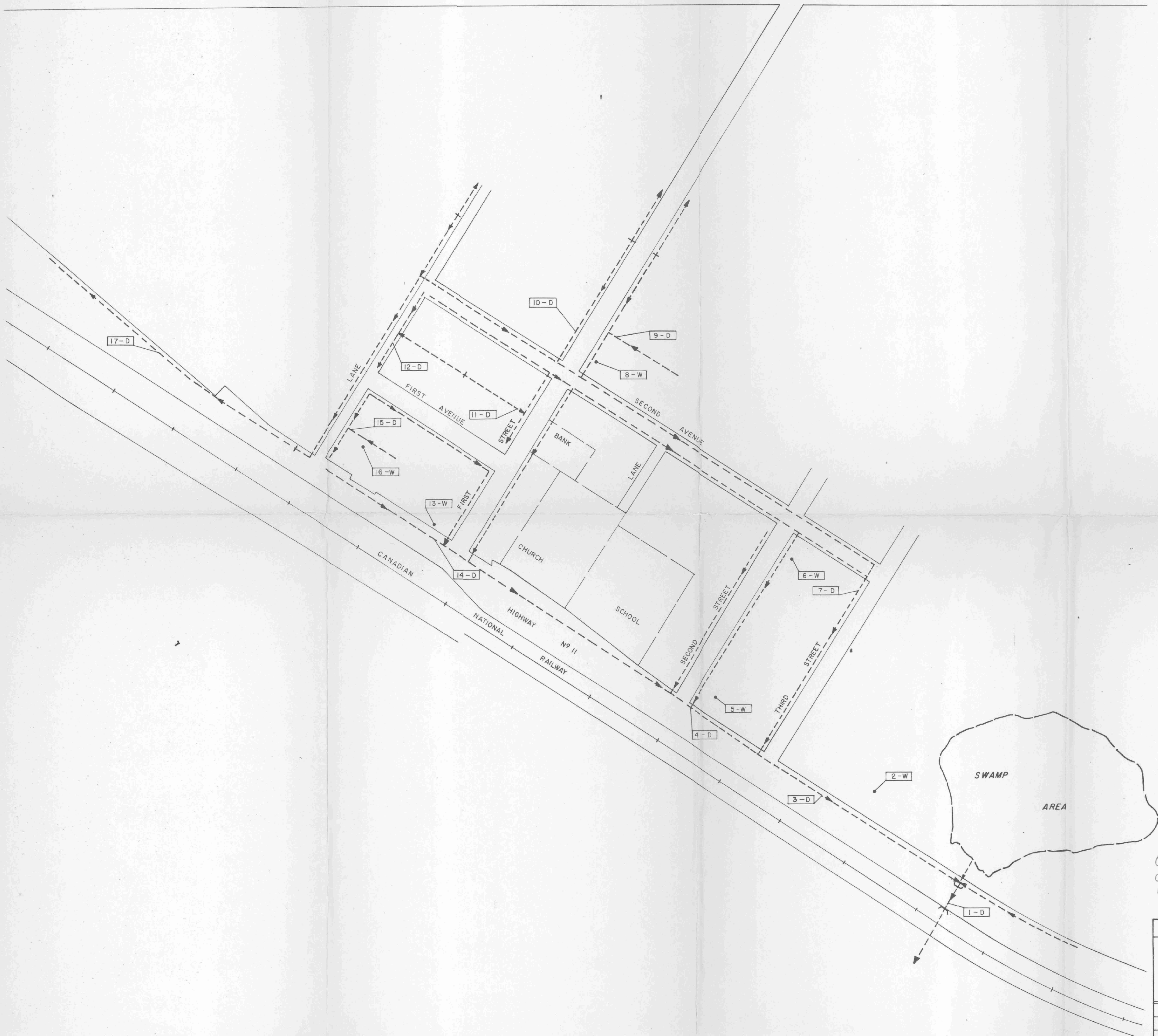
TABLE II-A (cont'd)

| Sampling Point No. | Location | Date | MPN | |
|--------------------------|--|------------|-----------------------------------|------------|
| | | | Coliform Organisms per 100 ml. | |
| | | | Fecal | Total |
| 14-D | Roadside ditch on north side of Hwy. No.11 near First Street | July 31/70 | 800,000+ | 8,000,000+ |
| 15-D | Drainage ditch discharging to Lane Street roadside ditch near Hwy.No.11 | July 31/70 | 90,000 | 2,000,000 |
| 17-D | Roadside ditch on north side of Hwy.No.11 at west side of community | July 31/70 | 800,000+ | 8,000,000+ |

TABLE II-B

CHEMICAL ANALYSES OF DITCH CONTENTS

| SAMPLE NO.- | <u>1 - D</u> |
|-------------------------------|--------------|
| B.O.D. (ppm.) ⁵ | 2.5 |
| - Total | 800 |
| Solids - Suspended | 5 |
| (ppm.) - Dissolved | 795 |
| - Free Ammonia | 0.1 |
| - Total Kjeldahl | 0.62 |
| Nitrogen | |
| as N - Nitrite | 0.02 |
| (ppm.) - Nitrate | 0.18 |
| - Total | 0.20 |
| Phosphorus | |
| as P - Soluble | 0.1 |
| (ppm.) | |
| Phenols | 0 |
| (in ppb.) | |



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LEGEND

- 2-D - SAMPLING POINT
TYPE OF SAMPLE
- D - DRAINAGE DITCH
- W - WELL



*Out
Civics
Water Treat*

| | |
|------------------------------------|-----------------------|
| ONTARIO WATER RESOURCES COMMISSION | |
| COMMUNITY OF VAL RITA | |
| TOWNSHIP OF OWENS | |
| WATER POLLUTION SURVEY | |
| 1970 | |
| SCALE: 1" = 200' | |
| DRAWN BY: R.D.L. | DATE: OCTOBER 1970 |
| CHECKED BY: | DRAWING NO. 70-164 DE |



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